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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

085.10905-US(03-245)

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on November 8, 2007

Signature

Typed or printed name Rachel Piscitelli

Application Number

10/737,138

Filed

December 16, 2005

First Named Inventor

Harry E. Eaton et al.

Art Unit

1794

Examiner

G. A. Blackwell

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record. 28,395
Registration number

☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 _____

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November 8, 2007

Date


NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Attachment to PTO/SB33 07-05)
Serial No. 10/737,138

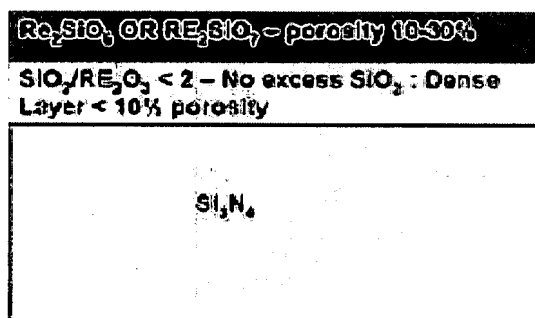


The principle object of the present invention is to provide a top coat for an environmental barrier coating (EBC) employed on a silicon based substrate wherein the top coat decreases the recession rate of the EBC protective coating in high velocity, high temperature, aqueous environments.

In order to achieve the foregoing object, the present invention is drawn to a composite comprising (1) a silicon based substrate, (2) an environmental barrier coating (EBC) comprising a protective layer and a silicon bond layer between the protective layer and the silicon based substrate, and (3) a top layer which comprises a velocity barrier layer. As defined in the instant specification, a velocity barrier layer is a layer positioned between a flowing gas stream and the underlying EBC protective layer wherein the velocity barrier layer acts to reduce the velocity of the gas stream which otherwise would impinge on the underlying EBC protective layer. The velocity barrier layer reduces the velocity of an impinging gas stream across the thickness of the velocity barrier layer which results in a decrease in recession rates of the EBC protective layer. The composite as set forth above is specifically claimed in pending in independent claim 19. Claim 19 has been rejected by the examiner over U.S. Patent 6,645,649 to Tanaka et al. in view of Applicants admitted prior art. It is respectfully submitted that this rejection belies the concept of a whole clause of 35 U.S.C. 103.

Tanaka et. al. (US 6645649) essentially teaches a two layer coating. Layer 1 formed on the substrate containing RE₂SiO₅ and/or RE₂Si₂O₇ with none or minimal excess SiO₂. Layer 1 is dense with porosity not exceeding 10% and most preferably less

than 2% (Column 3; Lines 35-40). Layer 2 is further applied on layer 1 with composition $RE_2Si_2O_7$ or RE_2SiO_5 that has a porosity of 5-30% to prevent cracking of layer 2 and increasing the life of the component. Tanaka et al. teach away from excess SiO_2 which makes coating layer 1 porous and is undesirable. Tanaka et al. do not understand, explain, or teach the effect of water vapor velocity and ways to prevent it. The figure below illustrates the Tanaka et al. composite.



Tanaka et al.

Application No, 10/737,138 on the other hand stresses the use of a porous top layer to reduce the velocity and thereby increasing the life of the EBC. Paragraph 2 in patent application clearly describes a typical "EBC" the velocity barrier layer aims to protect - it consists of a bond coat of silicon and a protective layer (mullite, BSAS etc). The EBC layer thus clearly consists of Silicon (source or excess silica) and a top layer. Thus a velocity barrier layer of porous yttrium silicate does not result in the same object as claimed by Tanaka et. al. This is shown in the following figure:

Porous Velocity Barrier
(BSAS, mullite, RE₂O₃, RE₂Si₂O₇, etc)
EBC (BSAS, mullite, RE₂SiO₆, RE₂Si₂O₇, etc)

Si (Si → SiO₂)

Si - based substrate

App'n. 10/757,136

There is no reason for Tanaka et al. to be modified as proposed by the examiner. To the contrary, Tanaka et al. would not find it desirable to provide a silicon bond coat between layer one and the silicon nitrate substrate as a silicon bond coat would be a source of excess silica which is undesirable and unwanted in the Tanaka et al. coating system. The present invention improves the life of typical EBC's which comprises a silicon bond coat and a protective layer by depositing on the protective layer a velocity barrier layer as claimed. Tanaka et al. does not recognize nor provide a solution for the problem that the instant application overcomes. Thus, the examiner's proposed modification of Tanaka et al. is undesirable in accordance with the teachings of Tanaka et al. and, therefore, would not be obvious to do as suggested by the examiner. The examiner's proposed combination of references belies the concept as a whole clause of 35 U.S.C. 103.

The examiner's rejection should be withdrawn.